Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Proposed PSD permit No. VF-02-004, Revision 1
ATOFINA Chemicals Inc.
CALVERT CITY, KENTUCKY 42029
NOVEMBER 26, 2003
JOSHUA J. HIGGINS, REVIEWER
Plant I.D. # 21-157-00007
Application Log # 55814

SOURCE DESCRIPTION:

1.1 Container packaging operations

ATOFINA Chemicals, located in Calvert City, Marshall County, Kentucky, is proposing to package various blends of refrigerants that contain ozone depleting substances (ODS) into small containers or cylinders. The bulk of the facilities to perform this packaging are existing but have been out of use since 1995 (when this operation shifted to another facility). With some minor piping additions, these facilities will allow these operations to return to Calvert City plant. This packaging operation involves the receipt of used containers, evacuation of any residual container contents, cylinder cleaning, and loading of the refrigerant product.

1.2 R-22 Transloading

ATOFINA Chemicals is requesting a slight increase in the transloading of R-22 refrigerant to tank trunks, ISO containers, and railcars to accommodate a possible increase for that operation. The Calvert City facility no longer makes R-22, but does have a limited operation to transload it. The refrigerant is received primarily in the rail cars and tank trucks, and unloaded to pressurized storage tanks. Once the refrigerant is unloaded, any remaining material in the transfer lines is cleared with no emissions. The refrigerant is later loaded from the pressurized storage vessels to storage rail cars, tank trucks, or ISO containers for shipment offsite. The vapor space of the truck is recovered by a process recovery device (condenser) and returned to the pressurized storage tanks. Some emissions result from the vapor recovery systems venting out non-condensables from the trucks/car.

1.3 Equipment Fugitive Emissions Sources

The large majority of the piping and equipment involved in loading of refrigerants is existing, but has not been used for several years. Additionally, this project includes the addition or replacement of small amounts of piping and compressors. Some emissions can result from the occasional leaks that can develop in the moving parts of these piping and compressor systems.

1.4 R-22, F-408a, F-409a Canister Dryer Desiccant Change-out

Canister dryers are used as needed to remove moisture from refrigerant products. The current project will include the addition of new dryers for R-22, F-408a, and F-409a refrigerants. The desiccant in each dryer will periodically require a change-out. A change out consists of evacuating the dryer vessel contents to a recovery system, opening the dryer, and adding new desiccant. When the dryer

is opened, a small amount of residual ODS is released to the atmosphere.

1.5 Container Shot-Blasting and Painting

Prior to refilling used containers that have been returned to ATOFINA, the containers are cleaned and repainted. The cleaning is accomplished by shot-blast equipment. Once the containers are shot cleaned, they are then painted.

The proposal for cylinder filling and evacuation (container packaging operations) will lead to the emissions of 0.22 and 12.0 TPY of ODS respectively. This would trigger PSD, since the PSD major source threshold is > 0 tons of ODS. A federally enforceable permit (F-00-021) was issued to ATOFINA in January 2002 for the R-22 transloading operation. ATOFINA took a limit of 10,000,000.00 lbs/year in that permit to avoid PSD. When they proposed to increase their limit to 15,000,000.00 lbs/year a PSD review was required (VF-02-004), and will be subject to the provisions of PSD again in order to increase the limit to 18,000,000.00 lbs/year. The emissions from packaging area fugitives is 16.3 TPY of ODS, hence this is also subjected to provisions of PSD. The emissions from the Canister Dryer Desiccant Change-out are 0.07 TPY of ODS, and is also subject to provisions of PSD. The emissions from Shot – Blasting and Painting are PM and VOC. These emissions are below the PSD significant levels of 25/15 TPY for PM/PM10 and 40 TPY for VOC. Hence, this project doesn't trigger PSD for PM/PM10 or VOC.

CREDIBLE EVIDENCE:
This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

APPLICATION COMMENTS:
I. Initial Issuance, VF-02-004, Log # 54788
II. Significant Revision, VF-02-004, Revision 1, Log # 55814

B. COMMENTS:
(This "Comments section" has Division's comments only)

1. Type(s) of control and efficiency:
   See BACT discussion below for details.

2. Emission factors and their source:

   i. ODS emissions are generated from cylinder filling, cylinder evacuation and R-22 transloading. There are fugitive emissions from packaging area.
   ii. The emissions from cylinder filling, cylinder evacuation and R-22 transloading are calculated using emission factors from engineering estimate, using container volume and vapor densities. The emissions from packaging area fugitives are calculated using emissions factors obtained from Table 2.1 of U.S. EPA "Protocol for Equipment Leak Emissions Estimates", EPA-453/R-95-107, November 1995. \
   iii. PTE for PSD applicability determination for cylinder filling, cylinder evacuation and packaging area fugitive is calculated based on maximum annual container process per year. For R-22, it is calculated based on 15,000,000 lbs/year. Actual emissions are submitted based on 60 % and 90 % control efficiency of vapor recovery system for packaging fugitives and R-22 transloading respectively. PTE for Shot-Blasting and Painting is calculated based on 8760 hours/yr.

3. Applicable Regulations
   i. 401 KAR 51:017 (40 CFR 52.21), *Prevention of Significant Deterioration of air quality,* applies to the following emission points -
   Cylinder Filling
   Cylinder Evacuation
   R-22 Transloading
   Packaging Area Fugitive
   ii. 401 KAR 63:020, Potentially Hazardous Matter or Toxic Substances applies to the following emission points-

   Cylinder Evacuation
   R-22 Transloading
   Packaging Area Fugitive

   iii. 401 KAR 59:010 New Process Operations applies for the following emission points:
   Cylinder Shot-Blasting

4. Anything unusual about the:
   i. Emission points (number and description) - No
   ii. Regulations that are not applicable - No

C. PSD REVIEW:

1. Applicability:

ATOFINA Chemicals Inc. (SIC 2819 Refrigerant Packaging Equipment) falls under one of the 28 listed major source categories under PSD and is located in a county classified as attainment or unclassifiable pursuant to Regulation 401 KAR 51:010. The facility is currently a major source.

The proposed modification involves packaging of various blends of refrigerants that contain ozone depleting substances (ODS) into small containers or cylinders and an increase in the R-22 refrigerant transloading limit. The BACT determination is based on emissions from cylinder evacuation, R-22 transloading and packaging area fugitives.

The ODS emissions proposed modification is 42.84 TPY uncontrolled. This modification by itself is subject to a PSD evaluation. No de-minimis air quality level is provided for ozone. The cylinder filling, cylinder evacuation, R-22 transloading and packaging area fugitives will be evaluated for BACT.

A PSD review involves the following six requirements:

i. Demonstration of the application of Best Available Control Technology (BACT).
ii. Demonstration of compliance with each applicable emission limitation under Title 401 KAR Chapters 50 to 63 and each applicable emission standard and standard of performance under 40 CFR 60 and 61.
iii. Air quality impact analysis.
iv. Class I area(s) impact analysis.
v. Projected growth analysis.
vi. Analysis of the effects on soils, vegetation, and visibility.

Air quality impact analysis and Class I area(s) impact analysis were not performed as there is no de-minimis air quality level provided for ozone. ATOFINA has ODS emissions from refrigerant packaging equipment. NAAQS does not exist for ODS. Hence, modeling for ambient air quality is not required. However, available monitoring data has been reviewed and ODS's have been modeled for toxic impacts. This following review demonstrates that all regulatory requirements will be met and includes a proposed permit, which establishes the enforceability of all applicable requirements.

2. PSD Modifications

The proposed permit will authorize the following proposed modifications, which are subject to a PSD review:

i. Cylinder Filling
ii. Cylinder Evacuation
iii. R-22 Transloading
iv. Packaging Area Fugitives

3. PSD Pollutants

The table below lists the net significant change in emissions for all PSD regulated pollutants.

Pollutant	Emissions after Proposed Modifications (TPY)
ODS	42.84

The annual emissions presented in this analysis were calculated based on maximum hourly emission rates after controls (the level of control required was determined through a BACT analysis, see **C**. 4. BACT Review). As seen from the table above, the proposed modification will be subject to a PSD review for ODS.

4. BACT Review

Pursuant to State Regulation 401 KAR 51:017, Section 9 (1) and (3), a major stationary source subject to a PSD review shall meet the following requirements,

i. The proposed source shall apply best available control technology (BACT) for each pollutant that it will have the potential to emit in significant amounts.
ii. The proposed source shall meet each applicable emissions limitation under Title 401, KAR Chapters 50 to 63, and each applicable emission standard and standard of performance under 40 CFR 60 and 61.

The proposed source will result in emissions of Ozone Depleting Substances (ODS) at levels that exceed PSD ›0 TPY. Therefore, ODS emissions shall be subject to a BACT review.

ATOFINA has presented in the permit application, a study of the best available control technology for ODS at each affected facility in the proposed modification. The proposed modification consists of Cylinder Filling, Cylinder Evacuation, R-22 Transloading, Packaging Area Fugitive. The Division has reviewed the proposed control technology in conjunction with information available in U.S. EPA's RACT/BACT/LAER Clearinghouse and the BACT/LAER Information System (BLIS) database. A summary of the proposed control technology is tabulated below in the table

Stack ID	Affected Facility	Pollutant	Control Technology (Efficiency)	Control Technology	Controlled Emission Level (lbs/Hr)	Controlled Emission Level (tons/year)
01	Cylinder Filling	ODS	100 %	Vapor Recovery System	0.57	0.049
02	Cylinder Evacuation	ODS	100 %	Vapor Recovery System	44.2	11.85
03	R-22 Transloading	ODS	90 %	Vapor Recovery System	3.2	14.1
04	Packaging Fugitive Area	ODS	60 %	LDAR	29.7	16.7

Note: There are no other applicable ODS emissions limitations under Title 401, KAR Chapters

50 to 65, or under 40 CFR 60, 61. Pursuant to 401 KAR 63:020 ATOFINA has submitted air toxic modeling.

As discussed above, ATOFINA's modification consists of cylinder evacuation, cylinder filling, R-22 transloading, and packaging area fugitives. All these processes have two stages before they are emitted into the ambient air. Emissions are captured first and are directed to control equipment. The BACT for each of the processes will discuss both the processes:

A. BACT for Container Filling and Evacuation Processes:

When used containers arrive for reuse, they frequently contain some residual refrigerant under slight pressure. To assure product quality and to avoid contamination, it is necessary to completely evacuate any residue before refilling the containers. This is accomplished by first connecting the container to the vapor recovery system. ATOFINA has looked at three control technologies to capture ODS emissions from the container filling and evacuation.

- Vapor recovery system with condenser/cooler.
- Vapor collection with carbon absorption.
- Vapor destruction with thermal oxidation.

Vapor recovery system consists of a cooler/condenser system to allow the recovery of the refrigerant while depressurizing the containers to approximately 0 psig. The residual refrigerant in the containers vaporizes at this low pressure and is fully condensed and recovered in the recovery system. This control method is considered technically feasible and is considered as a baseline control. ATOFINA has proposed to use control technology 1, vapor recovery system.

Control technology 2, carbon adsorption, is an effective way for organic compounds. The relative simplicity of this are an advantage for controlling low flow rates, intermittent streams, or the one's with varying flow rate. The primary costs are the costs of the carbon itself and the regeneration of the carbon. Regeneration of the carbon is done by passing the carbon containing organic compounds through a steam line, thus steaming the organic compound off the carbon. However, this is not feasible in this case, since ODS is hydrophilic in nature. Care must be taken to keep moisture out of refrigerants to avoid product contamination. ODS combines with moisture to form a semi-solid "globs" that are created by mixing water and refrigerants.

Control technology 3, is the most common way to dispose of industrial gases containing organic material. Thermal units burn the organic material in the combustion chamber typically operating between 1400 to 1600 degree F. In presence of a catalyst, this is carried out at a lower temperature, i.e. around 600-700 degree F. When organic compounds that contain chlorine and fluorine, such as HCFC's ODS, are burned, their products are acid gases such as HF and HCl. Therefore, thermal oxidizers of chlorinated or fluorinated hydrocarbons would need to be followed by a scrubber unit to control the emissions of these compounds. Additionally, HF and HCl are extremely corrosive and require that all the equipment utilize specialized metallurgy. The need for the multiple control measures and the need for the expensive alloy of the materials significantly increases the cost of the thermal oxidation. The cost of the thermal oxidation and the gas scrubbing is further increased due to the intermittent and variable flow rate of the stream. In case of option 2 the projected cost is $ 24,800.00 / ton and for control technology 3 the projected cost is $ 55,600 /ton.

ATOFINA proposes to use vapor recovery system as BACT for container filling and evacuation process. After scrutinizing the control technologies submitted by ATOFINA, the Division agrees with the proposal. No information is available in the BACT/RACT/LAER Clearinghouse.

The following table lists the top down evaluation of control technologies for Container Filling and Evacuation process:

S No.	Technology	% Control	Emissions Rate (TPY)	Capital Investment	Annual operating and capital recovery costs ($/yr)	Average cost effectiveness ($/ton)	Other Impacts
1	Thermal Oxidation with Scrubber	98	0.2	$744,398	$ 292,000	$24,800	Energy costs. Need for scrubber for acid gases creates additional costs and environmental impacts
2	Carbon absorption	90	1.2	$309,994	$601,000	$55,600	Disposal of spent carbon. Limited absorption of some CFCs
3	Vapor recovery to 0 psig	Base** case	12	N/A	N/A	N/A	Product recovery

** Base case is the proposed controls, which involves fully depressurizing equipment to a vapor recovery system, which essentially recovers 100 % of the refrigerants.

B. <u>BACT for R-22 Transloading</u>

This current project is not physically modifying the rail car, tank truck and ISO container loading facilities or operations and therefore, it would not normally be necessary for these operations to have to meet BACT. However, this project does request an increase to an existing permit throughput limit on this loading which was previously imposed, in part, to avoid PSD.

ATOFINA has requested to raise the throughput limit from 10,000,000.00 lbs/year to 15,000,000.00 lbs/year. Total emissions from R-22 transloading are controlled by vapor recovery system. Total emissions are 16.7 TPY of ODS based on 15,000,000 lbs/year. Additional controls that were considered were the same as the previous control options. Therefore, ATOFINA has considered thermal oxidation and carbon absorption followed by scrubbing as potential control options. The cost of these control systems, for the previous evaluation of 12 TPY is expensive. However, ATOFINA has considered the potential cost effectiveness of a single system to control both sets of emissions, combining the emissions from the container filling and evacuation and R-22 transloading i.e. 12+16.7=28.7 TPY. The table below gives the cost effectiveness of each of these control options at this higher emissions basis. Thermal oxidation is approximately $12,000 ton/yr and carbon absorption is $50,300 /ton. ATOFINA contends neither option is economically feasible. ***Therefore, the use of the existing vapor recovery system is proposed as BACT, by ATOFINA, for the R-22 refrigerant loading emissions.*** After scrutinizing the control technologies submitted by ATOFINA, the Division agrees with the proposal. No information is available in the BACT/RACT/LAER Clearinghouse. However, the Division made a minor change suggesting that 15,000,000 lbs/year also be included as

a BACT

The following table lists the top down evaluation of control technologies for Container Filling and Evacuation process and R-22 transloading (combined):

S No.	Technology	% Control	Emissions Rate (TPY)	Capital Investment	Annual operating and capital recovery costs ($/yr)	Average cost effectiveness ($/ton)	Other Impacts
1	Thermal Oxidation with Scrubber	98	0.6	$1,263,960	$ 345,151	$12,100	Energy costs. Need for scrubber for acid gases create additional costs and environmental impacts
2	Carbon absorption	90	2.9	$526,360	$1,311,622	$50,300	Disposal of spent carbon. Limited absorption of some CFCs
3	Vapor recovery to 0 psig	Base** case	12	N/A	N/A	N/A	Product recovery

** Base case is the proposed controls, which involves fully depressurizing equipment to a vapor recovery system, which essentially recovers 100 % of the refrigerants.

C. Fugitive Equipment Leaks

Some emissions result from the equipment leaks that can develop in the moving parts of the piping and compressor systems. Valve stems, compressor seals and pump seals can all be the sources of emissions leaks. ATOFINA has proposed Leak Detection and Repair (LDAR) as the BACT.

Valve and Pump Emissions

An LDAR program is structured to detect and repair equipment that is found to be leaking. This is the top alternative. The VOC LDAR programs would not work for ODS. Therefore, specialty equipment would be necessary. ATOFINA has proposed to develop a custom LDAR program for use at these packaging facilities.

Quarterly monitoring and repair of the piping components in this service is estimated to provide approximately 60 % control, which would represent a potential emissions decrease of as much as 21 TPY. The estimated cost for the quarterly monitoring of the number of components in the plant, according to ATOFINA, is $20,000/yr. This represents a very reasonable cost effectiveness of less than $1000 /ton. Increase in the monitoring to monthly would increase the control efficiency. However, it would require three times more monitoring and would potentially increase the control effectiveness only by 10 %.

Based on the described above factors, use of a custom ODS LDAR program with quarterly monitoring is proposed as BACT by ATOFINA. The Division agrees with this proposal and found no similar facilities after reviewing the BACT/RACT/LAER Clearinghouse.

Compressor Emissions and Evaluation

Three new compressors are being installed as the part of the project. The most stringent control approach to minimize emissions from leaks from a compressor shaft seal is to provide dual seals with the space between the seals vented to a vapor recovery or destruction system. ATOFINA has proposed to have dual seals on the shaft with the space between them vented to the compressor suction. This compressor operates with its suction pressure at approximately atmospheric pressure. ***Therefore, use of dual seals with vent back to the compressor suction will virtually eliminate leaks to the atmosphere, according to ATOFINA, and is proposed as BACT.*** The Division agrees with the proposal.

5. Air Quality Impact Analyses

Pursuant to Regulation 401 KAR 51:017, Section 12, an application for a PSD permit shall contain an analysis of ambient air quality impacts in the area that the proposed facility will affect for each pollutant that it will have the potential to emit in significant amounts as defined in Section 22 of the same regulation. The purpose of this analysis shall be to demonstrate that allowable emissions from the proposed source will not cause or contribute to air pollution in violation of

i. A national ambient air quality standard in an air quality control region; or
ii. An applicable maximum allowable increase over the baseline concentration in an area.

ATOFINA emits ozone depleting substances (ODS). This is a pollutant that has no de-minimis ambient air quality levels. However, ODS is a toxic substance and it requires air toxic modeling. ATOFINA has submitted an air toxic modeling report and Division has verified that report. According to the report, the modeled levels were less than the Region IX Pre Remediation Goals (PRG) number for the different pollutants under ODS categories. Hence, ATOFINA doesn't require monitoring the air quality.

Modeling Results - Air Toxics Analysis

The proposed construction will emit ODS, an air toxic pollutant regulated under Kentucky State Regulation 401 KAR 63:020, Potentially hazardous matter or toxic substances. The refrigerant packaging facilities will handle multiple materials. Two of the several refrigerants do have Region IX PRG values. The materials and the applicable PRG s are shown in the table below. To provide the most conservative evaluation of potentials emissions impacts, ATOFINA has considered 42.8 TPY emissions modeled as if they were all R-22, which has the lowest PRG. This modeling has been performed using the SCREEN3 model. There are no toxic emission limitations specified in the permit for this construction.

Material handled	**CAS number**	**Region IX PRG ($\mu g/m^3$)**
R-22 (Chlordifluoromethane)	75-45-6	51,000

F-125 (1,1,1,2,2-pentafluoroethane)(this is a component of R408 refrig. Blend)	354-33-6	N/A
F-143a (1,1,1-trifluoroethane) (this is a component of R408a refrig. Blend)	420-46-2	N/A
F-124 (1-chloro-1, 2,2,2, -tetrafluoroethane) (this is a component of R409a refrig. Blend)	63938-10-3	N/A
F-142b (1-chloro-1, 1-difluoroethane) (this is a component of R409a refrig. Blend)	75-68-3	52,000

The project emissions come from three different activities: railcar loading, cylinder evacuation, and equipment leaks. Railcar loading (RAILCAR) is a controlled activity that has been represented in SCREEN3 as a point source. The other two areas have been represented as an area source because they occur as fugitive emissions at various points within the packaging area. The table below shows the parameters modeled for each of the sources.

Modeling Parameter	**Source: RAILCAR**	**Source: FUGITIVES**
Source type	Point	Area
Emissions Rate	0.48 g/s (16.7 TPY)	1.29E-04 g/s/ m^2 (26.1TPY)
Height	3.048 m (10ft)	1.219 m (4ft)
Dimensions	0.15m (0.5 ft) D, 0.019 m/s (0.283 acfm)	76.2 (250 ft) L and W
Stack Gas Temp	293 K (68 F)	N/A
Max. Predicted Concentration	10060 $\mu g/m^3$ (1 hr average at 35 meters distance)	4443 $\mu g/m^3$ (1hr avg. at 76 meters distance)

The highest predicted ground level concentrations for the sum of the pollutants (ODS) emitted is 14503 $\mu g/m^3$ (max. 1 hr average) calculated using the previously described methodology. This theoretical worse case concentration would occur within approximately 250 feet (76 meters) from the assumed center of the sources, which is well within the ATOFINA Chemicals property boundary and is less than the 30 % of the Region IX PRG. Also, the ambient concentration of this pollutant from these emissions is well below the most conservative PRG of 51,000 $\mu g/m^3$ for R-22 both outside of and within the ATOFINA Chemicals facility.

6. Additional Impact Analyses

a. Construction and related emissions – N/A

b. Growth Analysis – The proposed refrigerant packaging project will allow the ATOFINA Chemical plant to add about 15 new permanent employee positions to the facility. This increase in staff will not impact local population since the local Marshall county population is approximately 30,000 people

and there are approximately 100,000 more population in the surrounding communities. This project will not impact local municipal services nor will it necessitate any new commercial or industrial activities.

Similarly, the construction activities of this project involve only some minor piping modifications that can be handled by local labor. This minor piping work also will not create significant construction emissions. There are no ODS emissions associated with construction and ATOFINA will take appropriate precautions to prevent particulate matter from becoming airborne due to construction.

c. *Soils and Vegetation Impacts Analysis* – The project is not expected to have an impact on soils or vegetation. The primary ecological impact of the emissions of ozone depleting substances (ODS) is their cumulative impact on the upper atmosphere. In this regard, ATOFINA is on schedule for phasing out the manufacture and use of these compounds consistent with Federal requirements in 40 CFR Part 82.

For the above reasons, the growth related impacts and other impacts associated with this project are negligible.

PUBLIC AND U.S. EPA REVIEW:

On October 30, 2002 the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in The Lake News in Calvert City Kentucky. The public comment period ended on November 30, 2002. During this time comments were received from the U.S. EPA and also from the company. These comments and the Division's response are listed in Attachment A and B to Section I, and are incorporated in the proposed permit where appropriate. U.S. EPA has 45 days to comment after receiving this proposed permit. ATOFINA will be notified if any changes are made to the final permit based on the U.S.EPA comments.

ATTACHMENT A to Section I

COMMENTS FROM U.S. EPA
AND
DIVISION'S RESPONSE TO COMMENTS

Comment 1. The proposed best available technology (BACT) appears reasonable based on the premise that the throughput quantity of certain refrigerants (and therefore, ODS emissions) will decrease substantially over time. KY DAQ may wish to consider adding a provision that the allowed throughput quantities will be reviewed at the date certain and adjusted downward consistent with the phase-out schedule of specific refrigerants.

Response: This permit's review and BACT analysis were based on the conservative assumption that refrigerant throughputs and emissions would stay constant at maximum rates. Since the BACT conclusions did not depend upon an assumption of decreasing throughputs, KY DAQ could not find any basis to require such a permit condition or a condition to require a re-evaluation of BACT at some future time. Therefore, no such permit language is added. However, KY DAQ is adding a note in the permit stating "ATOFINA has to phase-out the refrigerants addressed in 40 CFR 82 - Protection of Stratospheric Ozone."

Comment 2. KY DAQ includes in the statement of basis the results of the BACT cost evaluations in the permit application. We have already pointed out to KY DAQ some questionable items and one erroneous item in these evaluations. These items are as follows:

a. The applicant references the 1995 edition of EPA BACT cost evaluation document entitled *OAQPS Control Cost Manual.* This edition was superseded by a newer edition which was available at the time the permit application was prepared. The newer edition is entitled *EPA Air Pollution Cost Manual* (Sixth Edition, January 2002). We do not believe that use of the newer edition would materially affect the results obtained.

Response: Division agrees with EPA's comment. Since these calculations were initially submitted by ATOFINA, KY DAQ has asked ATOFINA to resubmit the calculations and address the EPA's comment. KY DAQ agrees with ATOFINA's response.

ATOFINA's Response: The most recent guidance within the January 2002 edition Cost Manual for carbon absorbers is an update in September 1999. The cost factors of that edition exactly match the basis of our original calculations. The most recent guidance for thermal oxidizers (Incinerators. September 2000) matches almost all of the factors used in our original calculations. The major exceptions are noted in EPA's comment (b) and (c) below. Additionally, we noted two other minor differences regarding "piping" and "engineering". The attached revised calculations have been updated to reflect all these changes. Regarding the Piping and Engineering cost factor changes, we made the following changes: the Piping (direct installation cost) factor of 0.02*PEC has been changed to a Piping and Painting factor of 0.012*PEC; and the Engineering factor (indirect installation cost) is revised from 0.1*PEC to 0.01*PEC. (Note: PEC is Purchased Equipment Cost)

b. The applicant uses a cost factor of 0.20 times pollution control equipment cost to estimate instrumentation cost. This differs from the 0.01 factor in the *EPA Air Pollution Control Cost Manual*. The explanation provided by the applicant is that a higher cost factor is warranted

by the "hazardous nature of the material and site interlock requirements". We are not sure this is an appropriate justification, However, use of the lower coat factor (0.10) would not substantially change the final cost effectiveness calculations.

Response: Division agrees with EPA's comment. Since these calculations were initially submitted by ATOFINA, KY DAQ has asked ATOFINA to resubmit the calculations and address the EPA's comment. KY DAQ agrees with the ATOFINA's response.

ATOFINA's Response: ATOFINA believes 0.20PEC is a reasonable estimate for this unique application, however, the attached updated cost estimates are revised using 0.01*PEC.

c. The annual cost of maintenance estimated by the applicant is 0.10 times the total equipment purchased. The estimated method recommended in the *EPA Air Pollution Control Cost Manual* for the thermal oxidation is a maintenance labor cost based on the 0.5 hours per shift plus materials cost equal to the maintenance labor cost. Use of the *EPA Air Pollution Control Cost Manual* approach would produce a substantially lower annual maintenance cost and as associated lower annual overhead cost.

Response: Division agrees with EPA's comment. Since these calculations were initially submitted by ATOFINA, KY DAQ has asked ATOFINA to resubmit the calculations and address the EPA's comment. KY DAQ agrees with the ATOFINA's response.

ATOFINA's Response: ATOFINA has revised the maintenance costs according to suggested new OAQPS methodology.

d. In the cost evaluation for the thermal oxidation device to control emissions from both R-22 truck loading and the container evacuation, the applicant calculated an annual capital recovery cost of $105,985. This was erroneous carry over from the cost evaluation for controlling container evacuation emissions alone. This annual capital recovery cost for truck loading and container evacuation control combined should be $179,988 (assuming that the applicant's instrumentation cost estimate is appropriate).

Response: Division agrees with EPA's comment. Since these calculations were initially submitted by ATOFINA, KY DAQ has asked ATOFINA to resubmit the calculations and address the EPA's comment. KY DAQ agrees with the ATOFINA's response.

ATOFINA's Response: ATOFINA has corrected this error, as suggested.

Based on the above-described re-analysis of the BACT review, the conclusions of KY DAQ's earlier permit review remain valid. KY DAQ believes that there will no changes (except for the Note added per Comment 1) to the draft permit that are warranted after consideration of US EPA's comments.

COMMENTS FROM ATOFINA
AND
DIVISION'S RESPONSE TO COMMENTS

Comment: Page 8, permit condition 5(d). We suggest deleting this language which describes how to calculate emissions from refrigerant loading. There is no corresponding emissions limit, therefore, it seems unnecessary to specify a calculation method. However, if the purpose of this language is to serve as documentation of the basis for the permit's throughput limit, then it could instead, be placed in the permit Statement of Basis.

Response: KY DAQ agrees with ATOFINA. Emissions calculations are removed from the permit.

Comment: Page 10, permit Condition 4: We would suggest the addition of the following language: *"(c) In lieu of initial monitoring of a component whose sight, smell, or sound indicates that it might be leaking as described in 401 KAR Section 61:175 4(1)(d), the permittee can instead assume that such a component is leaking, repair the leak within five days, and monitor with a portable detection device within 15 days to confirm the effectiveness of the repair."* Without this language, the rule could be interpreted to require testing before implementing a repair. This proposed change will also help expedite making the repair (rather than having to wait to monitor it first.) Also, this request would allow 15 days, rather than 5 days to perform the re-monitoring. We request this change because monitoring with a portable detection device is likely to require a greater lead time for scheduling that the 5 days otherwise allowed by the referenced regulation.

Response: KY DAQ agrees with ATOFINA. The above statement is added to specific monitoring requirements on page 10.

Comment: Page 10, permit Condition 4: We also suggest adding the following language: *"(d) Monitoring of pressure relief valves as described in 401 KAR 61:175 Section 4(1)(c) is required within 15 days after it has vented to the atmosphere."* This request would allow 15 days, rather than 5 days to perform the re-monitoring. As in our previous comment, we request this change because monitoring with a portable detection device is likely to require a greater lead time for scheduling that the 5 days otherwise allowed by the referenced regulation.

Response: KY DAQ agrees with ATOFINA. The above statement is added to specific monitoring requirements on page 10.

COMMENTS:
ATOFINA Chemicals, Inc. (ATOFINA) is requesting a revision to Permit VF-02-004 which was issued December 30, 2002, and authorized recommissioning existing refrigerant packaging facilities. With this revision ATOFINA is requesting the following changes:

- Increase container filling operations;
- Add eight container filling stations;
- Increase R-22 refrigerant transloading from 15,000,000.00 lbs/year to 18,000,000.00 pounds per year; and
- Add new R-22, F-408a, and F-409a canister dryers.

Because implementation of the changes originally authorized by Permit VF-02-004 are still in progress, these proposed changes were considered a continuation of the same project. As a result, the BACT analysis and the Air Toxic Modeling submitted with the original application are the same, except for minor adjustments and assumptions (See BACT discussion and Modeling section below for details).

Type of control and efficiency: See BACT discussion below for details.

Emission factors and their source:

1) See the initial issuance section above for cylinder filling, cylinder evacuation, fugitive emissions, and R-22 transloading emission factors.
2) For the Canister Dryer Desiccant Change-out emissions are calculated using engineering estimates, container volume, and vapor densities.

Applicable Regulations:

1) See the initial issuance section above for cylinder filling, cylinder evacuation, fugitive emissions, and R-22 transloading regulations.
2) For the Canister Dryer Desiccant Change-out 401 KAR 51:017 (40 CFR 52.21), *Prevention of Significant Deterioration of air quality,* and 401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances,* apply.

Anything unusual about the:

1) Emission point number and description: Emission units A33, A34, and PKE are new designations for emission units A30, A31, and A32 in permit F-00-021 (Revision 1). The conditions in this permit for emission units A33, A34, and PKE subsume the permit conditions listed for emission units A30, A31, and A32 in permit F-00-021 (Revision 1) issued March 18, 2002. As a result, groups A30, A31, and A32 were deleted from KyEIS, and their process units were reorganized under new groups A33, A34, and PKE. The reorganization better reflects how the facility actually operates, and the Title V permit, which is currently under review, will reflect the KyEIS organization and description for these emission units.

2) Regulations that are not applicable: None.

EMISSION AND OPERATING CAPS DESCRIPTION:
See the Permit Application Summary Form and permit VF-02-004, Revision 1.

PSD REVIEW:

Applicability:

See the initial issuance section above, additionally, this proposed modification involves an increase in packaging of various blends of refrigerants that contain ODS into small containers or cylinders, an increase in the R-22 refrigerant transloading limit, and adding R-22, F-408a, and F-409a refrigerant canister dryers. The BACT determination is based on increased emissions from cylinder filling, R-22 transloading, packaging area fugitives, and the canister dryer desiccant change-out.

The ODS emissions increase from this proposed modification is 5.76 TPY for a total of 48.6 TPY uncontrolled ODS emissions. This modification by itself is subject to a PSD evaluation. No de-minimis air quality level is provided for ozone. The cylinder filling & cylinder evacuation, R-22 transloading, packaging area fugitives, and the canister dryer desiccant change-out will be evaluated for BACT.

PSD Modifications:

The permit will authorize the following proposed modifications, which are subject to a PSD review:

- Increased Cylinder Filling & Cylinder Evacuation
- Increased R-22 Transloading
- Increased Packaging Area Fugitives
- R-22, F-408a, and F-409a Refrigerant Canister Dryers Change-out

PSD Pollutants:

Pollutant	**Net change in emissions from modification (TPY)**	**Emissions after Proposed Modifications (TPY)**
ODS	5.76	48.6

The annual emissions presented were calculated based on maximum hourly emission rates after controls (the level of control required was determined through a BACT analysis, see BACT Review). As seen from the table above, the proposed modification will be subject to a PSD review for ODS.

BACT Review:

ATOFINA has revised their study of the best available control technology for ODS at each affected facility from the original application to include the ODS emissions increase from this modification. Since the same basic BACT review process and technologies were used during this modification as during the initial issuance, this section is summarized to only include the updated control technology tables and top down evaluation tables for each process. A summary of the proposed control technology is presented in the table on the next page.

Stack ID	Affected Facility	Pollutant	Control Technology (Efficiency)	Control Technology	Controlled Emission Level (lbs/Hr)	Controlled Emission Level (tons/year)

Stack ID	Affected Facility	Pollutant	Control Technology (Efficiency)	Control Technology	Controlled Emission Level (lbs/Hr)	Controlled Emission Level (tons/year)
01	Cylinder Filling	ODS	100 %	Vapor Recovery System	1.12	0.22
02	Cylinder Evacuation	ODS	100 %	Vapor Recovery System	81.3	12.0
03	R-22 Transloading	ODS	90 %	Vapor Recovery System	29.7	20.0
04	Packaging Fugitive Area	ODS	60 %	LDAR	3.7	16.3
05	Canister Dryer Desiccant Change-out	ODS	100 %	Vapor Recovery System	--	0.07

Note: There are no other applicable ODS emissions limitations under Title 401, KAR Chapters 50 to 65, or under 40 CFR 60, 61.

BACT for Container Filling and Evacuation Processes:

See the initial issuance section above for a detailed explanation of each control technology. ***ATOFINA proposes to use vapor recovery system as BACT for container filling and evacuation process***. After scrutinizing the control technologies submitted by ATOFINA, the Division agrees with the proposal. No information is available in the BACT/RACT/LAER Clearinghouse.

The following table lists the top down evaluation of control technologies for Container Filling and Evacuation process:

S No.	Technology	% Control	Emissions Rate (TPY)	Capital Investment	Annual operating and capital recovery costs ($/yr)	Average cost effectiveness ($/ton)	Other Impacts
1	Thermal Oxidation with Scrubber	98	0.2	$681,419	$ 243,000	$20,700	Energy costs. Need for scrubber for acid gases creates additional costs and environmental impacts
2	Carbon absorption	90	1.2	$309,994	$601,000	$55,600	Disposal of spent carbon. Limited absorption of some CFCs
3	Vapor recovery to 0 psig	Base** case	12	N/A	N/A	N/A	Product recovery

** Base case is the proposed controls, which involves fully depressurizing equipment to a vapor recovery system, which essentially recovers 100 % of the refrigerants.

BACT for R-22 Transloading:

ATOFINA has requested to raise the throughput limit from 15,000,000 lbs/year to 18,000,000.00 lbs/year. Total emissions from R-22 transloading are controlled by a vapor recovery system. Total emissions are 20.0 TPY of ODS based on 18,000,000 lbs/year. Additional controls that were considered were the same as the previous control options. The cost of these control systems, for the previous evaluation of 12 TPY was expensive. However, ATOFINA has considered the potential cost effectiveness of a single system to control both sets of emissions, combining the emissions from the container filling and evacuation and R-22 transloading i.e. 12+20=32 TPY. The table below gives the cost effectiveness of each of these control options at this higher emissions basis. ***The use of the existing vapor recovery system is proposed as BACT, by ATOFINA, for the R-22 refrigerant loading emissions.*** After scrutinizing the control technologies submitted by ATOFINA, the Division agrees with the proposal. No information is available in the BACT/RACT/LAER Clearinghouse.

The following table lists the top down evaluation of control technologies for Container Filling and Evacuation process and R-22 transloading (combined):

S No.	Technology	% Control	Emissions Rate (TPY)	Capital Investment	Annual operating and capital recovery costs ($/yr)	Average cost effectiveness ($/ton)	Other Impacts
1	Thermal Oxidation with Scrubber	98	0.6	$1,227,427	$ 383,763	$12,200	Energy costs. Need for scrubber for acid gases create additional costs and environmental impacts
2	Carbon absorption	90	3.2	$591,448	$1436,497	$49,900	Disposal of spent carbon. Limited absorption of some CFCs
3	Vapor recovery to 0 psig	Base** case	32	N/A	N/A	N/A	Product recovery

** Base case is the proposed controls, which involves fully depressurizing equipment to a vapor recovery system, which essentially recovers 100 % of the refrigerants.

Fugitive Equipment Leaks:

See the initial issuance section above.

R-22, F-408a, F-409a Canister Dryer Desiccant Change-out:

A dryer desiccant change-out consists of evacuating the vessel to a recovery system, then opening the dryer to add new desiccant. When the dryer is opened, a small amount of ODS is released to the atmosphere. Prior to opening the dryer, ATOFINA depressurizes the vessel to very low pressures by sending contents to the vapor recovery system. This is done for safety and environmental reasons, and is a matter of standard procedures. Potential emissions from the desiccant changes at the

new dryers after employing the vapor recovery system are approximately 0.07 TPY ODS. Use of a vapor recovery system is the most common control method for refrigerant systems. ATOFINA previously demonstrated that additional control equipment for the 12 TPY emissions from container evacuation would not be cost-effective. Therefore, adding a thermal oxidizer or carbon absorption system would similarly not be cost-effective for these even smaller emissions. ***The use of the existing vapor recovery system is proposed as BACT, by ATOFINA, for depressurizing the dryer vessels prior to desiccant change-out.*** After scrutinizing the control technologies submitted by ATOFINA, the Division agrees with the proposal. No information is available in the BACT/RACT/LAER Clearinghouse.

Air Quality Impact Analyses:

See the initial issuance section above for the modeling methodology. The parameters were revised to reflect the most conservative scenario of 48.6 TPY of ODS emissions, and the modeling rerun. The parameters and the revised maximum predicted concentrations are summarized in the table below.

Modeling Parameter	Source: RAILCAR	Source: FUGITIVES
Source type	Point	Area
Emissions Rate	0.575 g/s (20.0 TPY)	1.41E-04 g/s/ m^2 (28.6TPY)
Height	3.048 m (10ft)	1.219 m (4ft)
Dimensions	0.15m (0.5 ft) D, 0.019 m/s (0.283 acfm)	76.2 (250 ft) L and W
Stack Gas Temp	293 K (68 F)	N/A
Max. Predicted Concentration	12,050 $\mu g/m^3$ (1 hr average at 35 meters distance)	4,856 $\mu g/m^3$ (1hr avg. at 76 meters distance)

The highest predicted ground level concentrations for the sum of the pollutants (ODS) emitted is 16,906 $\mu g/m^3$ (max. 1 hr average) calculated using the previously described methodology. This theoretical worse case concentration would occur within approximately 250 feet (76 meters) from the assumed center of the sources, which is well within the ATOFINA Chemicals property boundary and is less than 35 % of the Region IX PRG. Also, the ambient concentration of this pollutant from these emissions is well below the most conservative PRG of 51,000 $\mu g/m^3$ for R-22 both outside of and within the ATOFINA Chemicals facility.

Additional Impact Analyses:

See the initial issuance section above.

PUBLIC AND U.S. EPA REVIEW:

On October 22, 2003 the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in The Lake News in Calvert City, Kentucky. The public comment period ended on November 21, 2003. During this time comments were received from the company. These comments and the Division's response are listed in Attachment A to Section II, and are incorporated in the proposed permit where appropriate. U.S. EPA has 45 days to comment after receiving this proposed permit. ATOFINA will be notified if any changes are made to the final permit based on the U.S.EPA comments.

ATTACHMENT A to Section II

COMMENTS FROM ATOFINA AND DIVISION'S RESPONSE TO COMMENTS

Comment 1: For emission units PKA through PKD (Cylinder Evacuation, Filling, and Reclaim), Compliance Demonstration Method (a) for Operating Limitations: Records of the total volume of containers filled each month are not necessary, as there is no limit on volume filled, and volumes are not used in calculating emissions due to container filling (see equation under Compliance Demonstration Method (c) Cylinder Filling under Emissions Limitations. Recommend changing condition to:

> "*Compliance shall be demonstrated by keeping records of the number of containers filled each month, along with the total volume of containers evacuated ~~and filled~~ each month."*

Response: The Division concurs with this comment, and the permit has been revised as recommended.

Comment 2: For emission units PKA through PKD (Cylinder Evacuation, Filling, and Reclaim), Specific Monitoring Requirements: Items (a) through (c) are record keeping rather than monitoring requirements. Recommend deleting them from the Monitoring Requirements section, since they are redundant to requirements listed in Section 5 Specific Record Keeping Requirements. The exception is records of the monthly emission calculations, which is not listed in Section 5 and should be added there.

Response: The Division concurs that, in this case, the Specific Monitoring Requirements are redundant with the Specific Recordkeeping Requirements. The Specific Monitoring Requirements have been revised to state, "The Specific Recordkeeping Requirements listed below dictate the monitoring requirements." The exception noted above in Comment 2 has been revised as recommended in Comment 3, below.

Additionally, Specific Recordkeeping Requirement 5(d) was deleted since it only referenced the Specific Monitoring Requirements.

Comment 3: For emission units PKA through PKD (Cylinder Evacuation, Filling, and Reclaim), Specific Recordkeeping Requirement (a) should be revised to delete the requirement for records of volumes filled, and add the requirement to retain emission calculations, as discussed above.

> "*Retain records of the number of cylinders evacuated and filled each month, ~~and~~ the total volume of the cylinders evacuated ~~and filled~~ each month, and the calculated monthly evacuation and filling emissions."*

Response: The Division concurs with this comment, and the permit has been revised as recommended.

Comment 4: For emission units PKA through PKD (Cylinder Evacuation, Filling, and Reclaim), and

A33 and A34 (Forane Docks), Specific Reporting Requirement: Could the Division clarify whether a new "Standard Operating Procedure for Vapor Recovery System Vent Valve Openings" should be submitted within 90 days of the final revised permit, or whether the submittal required by the final permit issued December 30, 2002 has already fulfilled this requirement? This ambiguity could be removed by adding the following sentence:

> "*The permittee's submittal following the issuance of the December 30, 2002 permit VF-02-004 shall suffice to meet this reporting requirement.*"

Response: Since this revision only included an increase in cylinder filling and evacuation and in R-22 transloading, and did not include changes in the method of operation for these emission units, the same Standard Operating Procedure for Vapor Recovery System Vent Valve Openings will suffice. The recommended statement was added to the permit following the Specific Reporting Requirement.

Comment 5: For emission units A33 and A34 (Forane Docks), the control equipment description should be revised to clarify that the vapor recovery systems are controls specifically for R-22 transloading and blends loading. Other materials loaded (ODS and HCL) have different controls that are not the subject of this permit. The following language is recommended:

> A33 Forane Railcar Docks
> "Controls for R-22 transloading loading to railcars: Vapor recovery system with 90% efficiency"
>
> A34 Forane Tank Truck Docks
> "Controls for R-22 transloading, blend F-408a, and F-409a loading to tank trucks: Vapor recovery system with 90% efficiency"

Response: After confirming the use of additional controls for other materials with the reviewer preparing the Title V permit, the permit was revised as recommended.

Comment 6: For emission units A33 and A34 (Forane Docks), Specific Monitoring Requirements: Items (a) and (b) are record keeping rather than monitoring requirements. Recommend deleting them from the Monitoring Requirements section, since they are redundant to requirements listed in Section 5 Specific Record Keeping Requirements. Additionally, Specific Record Keeping Requirement (b) refers to monitoring R-22 transloading emissions. The permit does not require monitoring or records of R-22 transloading emissions. Rather, Specific Record Keeping Requirement (b) requires operational records. These small discrepancies arise when duplicate requirements are listed under both monitoring and record keeping, since it is difficult to keep them consistent when the permit is edited.

Response: The Division concurs that Specific Monitoring Requirement 4(a) is redundant with Specific Recordkeeping Requirement 5(a). In the original permit (VF-02-004), Specific Monitoring Requirement 4 (b) referenced Specific Recordkeeping Requirement 5(d). That recordkeeping requirement was deleted as the result of source comments on the original permit. Specific Monitoring Requirement 4(b) should have been deleted then, but never was. Both monitoring requirements have been deleted and replaced with the following:

> The Specific Recordkeeping Requirements listed below dictate the monitoring requirements.

Comment 7: For emission unit A35 (Dryer Desiccant Change-Out), the Specific Monitoring

Requirement seems to be a record keeping rather than monitoring requirement. Recommend deleting this from the Monitoring Requirements section, since it is redundant to requirements listed in Section 5 Specific Record Keeping Requirements.

Response: In order to be consistent with the rest of the permit, and as discussed with Atofina representatives on 11/25/03, the Division feels that this Specific Monitoring Requirement should remain unchanged.